

**APPLICATION FOR AN
AGRICULTURAL WATER CONSERVATION
FEASIBILITY STUDY GRANT**

FOR

Fresno Irrigation District

2907 S. Maple
Fresno, CA 93725

SUBMITTED TO THE:

DEPARTMENT OF WATER RESOURCES

UNDER THE

SAFE DRINKING WATER, CLEAN WATER, WATERSHED PROTECTION
AND FLOOD PROTECTION ACT (PROPOSITION 13)

February 28, 2002

Prepared By:



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PART ONE

A. Project Information Form

1. Applying for (select one):
- ☐ (a) Prop 13 Urban Water Conservation Capital Outlay Grant
- ☒ (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant
- ☐ (c) DWR Water Use Efficiency Project
2. Principal applicant (Organization or affiliation): Fresno Irrigation District
3. Project Title: Canal Automation and Regulation Basin Improvements Study
4. Person authorized to sign and submit
- | | |
|-----------------|--|
| Name, title | <u>Gary Serrato, General Manager</u> |
| Mailing address | <u>2907 S. Maple Avenue
Fresno, Ca. 93275-2218</u> |
| Telephone | <u>(559) 233-7161</u> |
| Fax | <u>(559) 233-8227</u> |
| E-mail | <u>gserrato@fresnoirrigation.com</u> |
5. Contact person (if different):
- | | |
|-----------------|---|
| Name, title | <u>Ronald Samuelian, P.E.</u> |
| Mailing address | <u>286 W. Cromwell Ave
Fresno, CA 93711</u> |
| Telephone | <u>(559) 449-2700</u> |
| Fax | <u>(559) 449-2715</u> |
| E-mail | <u>rsamuelian@ppeng.com</u> |
6. Funds requested (dollar amount): \$79,996
7. Applicant funds pledged (dollar amount): \$15,000
8. Total project costs (dollar amount): \$94,996

9. Estimated total quantifiable project benefits (dollar amount): not yet determined
- Percentage of benefit to be accrued by applicant: 100 %
- Percentage of benefit to be accrued by CALFED or others: N/A¹
10. Estimated annual amount of water to be saved (acre-feet): not yet determined
- Estimated total amount of water to be saved (acre-feet): not yet determined
- over N/A years.
- Estimated benefits to be realized in terms of water quality, in stream flow, other: Unknown
11. Duration of project (month/year to month/year): (03/02-09/03)
12. State Assembly District where the project is to be conducted: 29th, 30th, 35th, 31st
13. State Senate District where the project is to be conducted: 12th, 14th, 16th
14. Congressional district(s) where the project is to be conducted: 21st District
15. County where the project is to be conducted: Fresno
16. Date most recent Agricultural Water Management Plan submitted to the Department of Water Resources: 1986
17. Type of applicant (select one):
- Prop 13 Urban Grants and Prop 13 Agricultural Feasibility Study Grants:
- ☐ (a) city
- ☐ (b) county
- ☐ (c) city and county
- ☐ (d) joint power authority
- ☒ (e) other political subdivision of the State, including public water district
- ☐ (f) incorporated mutual water company

¹ This project's quantifiable benefits are locally cost-effective.

18. Project focus:
- ☒ (a) agricultural
☐ (b) urban
19. Project type (select one):
Prop 13 Urban Grant or Prop 13
Agricultural Feasibility Study Grant
Capital outlay project related to:
- ☐ (a) implementation of Urban Best
☒ (b) implementation of Agricultural Efficient
Water Management Practices
☐ (c) implementation of Quantifiable
Objectives (include QO number(s))

☐ (d) other (specify)

20. Do the actions in this proposal involve
physical changes in land use, or
potential future changes in land use?
- ☐ (a) yes
☒ (b) no
- If yes, the applicant must complete the
CALFED PSP Land Use Checklist found at
http://calfed.water.ca.gov/environmental_docs.htm
and submit it with the proposal.

**Consolidated Water Use Efficiency 2002 PSP
Proposal Part One
Signature Page**

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant; and

The individual signing the form read and understood the conflict of interest and confidentiality section and waiver any and all rights to privacy and confidentiality of the proposal on behalf of the applicant.

Signature

Name and title

Date

PART TWO

Project Summary

The proposed project is an investigation of system improvements, including canal automation, measurement and identification of regulation basins required to provide water conservation and improved operational delivery. These system improvements are listed as eligible in the Prop 13 Agricultural Feasibility Study Grant application packet and are consistent with eligible Agricultural Efficient Water Management Practices.

The Fresno Irrigation District is located in geographical center of Fresno County and extends to the north from the San Joaquin River, south to near the City of Fowler, and roughly from the Friant-Kern Canal at the base of the Sierra foothills to about 4.5 miles west of the City of Kerman. The District service area is approximately 245,000 acres and includes the Fresno/Clovis metropolitan area near its center. **Figure 1** shows the location of the District within Fresno County. The District now operates approximately 800 miles of canals and pipelines. Total irrigated area exceeds 150,000 acres, although this number has been decreasing in recent years as a result of urban expansion. The delivery system is divided into “service areas”, which define the areas served by a particular system. Surface water in the system generally flows in a southwesterly direction. It is anticipated that the focus of the work will generally be in the south and west areas of the District.

Fresno Irrigation District was formed in 1920 under the California Irrigation Districts Act, as the successor to the privately owned Fresno Canal and Land Company. The District’s water users include municipal, industrial and agricultural water users. The District delivers more than 500,000 acre-feet of surface water annually from the Kings River and Central Valley Project water through Friant-Kern Canal. Most of this water is delivered to agriculture, although an increasing share of the District’s water supply is used for groundwater recharge in the urban area. Following are system constraints that lead to non beneficial use of water, loss of water from the system and significant changes in flows from mainline canals to sublaterals:

- Average parcel size is 20 acres
- Most parcels are flood irrigated
- Delivery schedule is a 24-hour period
- Significant system flow fluctuation is experienced between day and night, as growers shut off during the evening
- Rotation of on-farm deliveries

The goal is **to ascertain if strategically located regulation basins and canal automation can beneficially use the regulated and conserved supply.**

It is anticipated that the benefits will include:

- Water savings within the District
- Improved system operation flexibility
- Greater on-farm flexibility
- Greater ability for supply to match irrigation demands

It is also expected that the benefits to the District will be greater than the costs.

A. Relevance and Importance

1. The nature of the project is an investigation of existing system delivery conditions to determine recommended system improvements.

The scope of the project is described in this application under Part B, and includes an evaluation of District facilities and operations, focusing primarily on locations with the most significant flow fluctuations leading to water lost to non beneficial use.

The objective of the study is to determine the primary locations for regulation improvements, anticipated to be regulation basins, measurement devices and canal automation, in order to maximize water conservation and regulation for operational flexibility.

2. Canal automation and regulation basins are needed to help continue the District's efforts to improve delivery by employing the best possible agricultural water management practices. The District has made similar system improvements that have provided the desired benefits of water conservation and system operational flexibility to meet hourly demand fluctuations in the system.

The investigation, and subsequent construction of feasible system improvements is consistent with the District's mission **"to protect and manage the surface and groundwater resources of the District in order to meet the present and future water needs of the people and the lands located within the District's boundaries."**

In pursuit of this mission, the District has combined forces with the City of Fresno (Fresno), the City of Clovis (Clovis), the County of Fresno (County), and the Fresno Metropolitan Flood Control District (FMFCD) in a cooperative effort to develop and implement a comprehensive surface and groundwater management program consistent with the Water Resources Management Plan for Fresno-Clovis Urban and Northeast Fresno County. The plan is a water quality and quantity project to plan for the preservation and enhancement of the area water supply. The goals of this plan include:

- **Maximize the available water supply, including conjunctive use of surface and groundwater**

- Conserve the water resource for long-term beneficial use and to assure an adequate supply for the future
- Manage water resources to the extent necessary to ensure reasonable beneficial and continued use of the resource

While farming has provided the economic base for the area for many years, the metropolitan area is growing at an accelerated rate, and continued agricultural production along with urban growth require a reliable water supply and related water quality. On August 12, 1996, the District's Board of Directors adopted a Groundwater Management Plan in accordance with California State Assembly Bill 3030. The goals of this plan and the District's comprehensive and conjunctive management program include, but are not limited to, the following:

- Plan and provide adequate water to satisfy future water requirements for municipal, industrial and agricultural uses within the District,
- **Maximize the use of surface water and avoid waste and flood losses.**

This project is consistent with the State's specific Principles of Implementation developed for the Integrated Storage Investigations (ISI) Program, including:

- Local planning process
- Local control of proposed projects
- Voluntary implementation of projects
- Priority for in-basin water needs
- Basin-wide planning and monitoring (to the extent applicable)

Figure 1
District map here.

B. Technical/Scientific Merit, Feasibility, Monitoring & Assessment

1. Methods, Procedures and Facilities

A complete task list is described in this application. The initial work will be to review existing flow records, system conditions, and operational constraints. Additional flow measurement or other data will be collected as needed to quantify the amount of water that can be conserved within a certain area of the District or reach of the system. The project team, consisting of District operational and engineering staff, along with consulting engineers will meet and review the flow record information and system constraints. A list of potential system improvements will then be developed. A comparison model will be developed to properly quantify the benefits of the potential system improvements. Criteria for prioritization will be created and the system improvement projects prioritized. The prioritization criteria will likely include, but not be limited to:

- Amount of water conserved
- System operational flexibility
- Land/right-of-way issues
- Project impacts, including preliminary environmental concerns

After the system improvement locations have been prioritized, a conceptual design of system improvements and the respective project impacts for each location will be prepared. A preliminary engineer's cost estimate will be prepared for construction, and operation & maintenance costs for the conceptual design. The District has recently installed and improved canal automation, and it is anticipated that design and construction costs will be similar to those improvements previously made.

After the conceptual design and cost estimate is prepared, the following will be determined:

- Local support for the system improvements
- Environmental impacts and requirements of the project and any significant environmental issues that may arise
- Compliance with federal, state, and local laws
- Permits, licenses, approvals, and agreements are needed for the project and probable requirements/conditions to secure such authorizations

A benefit/cost (B/C) analysis will be completed.

After completion of the system improvement impacts, construction methods will be considered, and an estimated construction schedule based on priority will be prepared.

Quarterly progress reports will be prepared and submitted to the Department of Water Resources (DWR). A draft feasibility study report will be prepared and submitted for review to DWR and other agencies, as appropriate. The final feasibility study report will be prepared and submitted to DWR.

2. Task List and Schedule

The work plan for the proposed Agricultural Water Conservation Feasibility Study details the scope of work needed to determine the water that can be conserved in the system and study the feasibility of regulation measures including regulation basins, canal automation and measurement. The objective of the feasibility study is to identify priority locations for system improvements, evaluate alternative system improvements, and analyze the cost-effectiveness of constructing the system improvements. The results and conclusions from the completed tasks will be incorporated into the feasibility study report. The work plan for the proposed feasibility study details the work from an engineering, economic, environmental, institutional, and social basis.

The study will be accomplished through the following tasks:

- Task 1. Review existing information to refine the feasibility study purpose and identify the goals to be attained.
- Task 2. Review flow records to evaluate flow fluctuations and amount of water to be conserved through reaches of various systems.
- Task 3. Evaluate existing system facility information, hydraulic conditions, and operational constraints.
- Task 4. Develop system improvement solutions based on Tasks 2 and 3.
- Task 5. Develop comparison to accurately analyze benefits from the existing and proposed systems.
- Task 6. Prioritize system improvement locations.
- Task 7. Prepare conceptual design of system improvements.
- Task 8. Determine system improvement impacts, including environmental impacts and requirements of the project.
- Task 9. Prepare preliminary engineer's cost estimate for construction, and operation & maintenance costs for the conceptual design.
- Task 10. Prepare Benefits/Cost Analysis.
- Task 11. Determine local support for the system improvements.
- Task 12. Determine compliance with federal, state, and local laws.

- Task 13. Determine which permits, licenses, approvals, and agreements are needed for the project and probable requirements/conditions to secure such authorizations.
- Task 14. Consider construction methods and develop an estimated construction schedule based on priority.
- Task 15. Prepare and submit quarterly progress reports to the Department of Water Resources (DWR).
- Task 16. Prepare and submit for review the draft feasibility study report to DWR and other agencies, as appropriate.
- Task 17. Prepare and submit for approval the final feasibility study report to DWR.

If in the event a determination is made that the project is not a feasible option, the District will discontinue work on the study. Discontinuing work on the feasibility study would require consultation with and approval from DWR and the District Board of Directors. Work on the feasibility study would stop except for the completion of a feasibility study report that would document the work complete to date and explain the non-feasible determination.

Timetable

3. Monitoring and Assessment

N/A – Not required for Prop 13 Agricultural Feasibility Study Grant

4. Preliminary Plans and Specifications and Certification Statement

N/A – Not required for Prop 13 Agricultural Feasibility Study Grant

C. Qualifications of the Applicants and Cooperators

FID Assistant Manager/Chief Engineer Michael Palmer, along with the District's engineering staff and operations staff will be part of the project team.

Provost & Pritchard Engineering Group, Inc. is the Consulting Engineer for FID and will provide project management and engineering services for the proposed project. Provost and Pritchard Engineering Group, Inc. is a consulting engineering firm, specializing in water resources engineering and planning, and engineering services for municipal infrastructure, private development and agricultural clients. Founded in 1968, the company currently has 15 employee stockholders, and a total staff of more than 50 people, who represent a mix of experienced engineering veterans and younger professionals. Provost & Pritchard has two San Joaquin Valley offices, located in Fresno and Bakersfield.

The following is a summary of the project management:

Project Manager

Brian Ehlers, PE is a Principal Engineer with Provost and Pritchard Engineering Group, Inc., and he has worked as a consulting engineer to the District for the past twelve years.

Project Engineer

Ronald J. Samuelian, PE is an Associate Engineer with Provost & Pritchard Engineering Group, Inc., and he currently provides on-going consulting services for FID (See Appendix).

D. Benefits and Costs

1. Budget Breakdown and Justification

Included as Table 1 is a breakdown of the proposed costs for the feasibility study.

2. Cost-Sharing

The Fresno Irrigation District will supply 300 man-hours for collecting data and reviewing system operations at a total cost share of \$15,000.

Cost breakdown

3. Potential Benefits to be Realized and Information to be Gained

The expected outcome is a feasible project recommending a prioritized list of system improvements to provide water conservation and operational flexibility.

The benefits to be realized are:

- Water savings for the District
- Conservation of water flowing through certain reaches of District's system
- System operational flexibility

4. Benefits Realized and Information Gained versus Costs

It is not known at this time how much water can be conserved by the construction or installation of the equipment described previously. However, from review of past records, it is clear that the District delivers over 500,000 acre feet of water a year. It is assumed that 1% of the total water delivery can be conserved through these measures, and it can be estimated that a benefit of 5,000 AF/yr could be realized. Likewise, costs are not known at this time but recent projects that have been constructed have resulted in a cost approximating \$30/AF. It could be expected that since costs and benefits would be realized in this study. Other benefits are thought to include:

- Delivery of water supplies matching irrigation demands
- Conservation of lost water
- Beneficial use of regulated supplies

E. Outreach, Community Involvement and Acceptance

The District has met, and will continue to meet with other local agencies to meet the needs of the changing system demands. As previously mentioned, the Fresno Metropolitan Flood Control District, County of Fresno, City of Fresno, and City of Clovis continue to work together with the District to provide and maintain the local water supply. The District has provided information to growers and other stakeholders regarding local and statewide issues through the District's webpage, newsletter, and public meetings. Telemetry and canal automation improvements similar to those studies in this proposed project, were the subject of a recent newsletter provided to all growers in the District.

APPENDIX

Resumes

[illegible]